

# Software description for Project Gateway



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**LEGO Media International, October 99**

## **Software description for Project Gateway**



**Launch Date:** December 2000

**Target Group:** 8 to 12 - boys

**Range:** The range includes 7 items (6 boxes for play materials and 1 box for LEGO cam and software)

**Software:** Video editing + inspirational material

**Hardware:** Camera

### THE IDEA...

...is to create an unlimited play environment that combines the positive aspects of construction play with LEGO play materials, the interesting and contemporary setting of a film studio environment, the fascination of using an advanced technological instrument that a miniature digital video camera represents, and finally the experience of being in control when manipulating and editing the recordings on the PC before showing it to an audience. The camera and the editing CD-ROM are attractive tools for the boys – even as stand-alone products – thereby enhancing the total attractiveness and play value when combined with the LEGO sets. Not only does the concept leverages from the four different elements, but it also – we believe – because of the natural link, create a synergy between the four that enhances the play experience and value. LEGO bricks, a camera and a film editing software all provide the best possibilities to stimulate the creativity and the imagination of children.

The product consists of 7 items for launch in December 2000. These are 6 play sets and one box with the LEGO cam and the software.

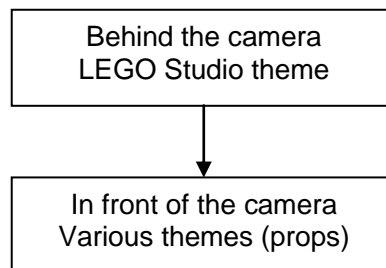
The play material assortment has 6 sets with different themes such as CITY and Western as well as a number of functions (earthquake maker, explosions simulator, collapsing buildings, etc...). The idea is that these can stand-alone but, if you also have the camera and the software, you can play these themes and functions and make movie thus extending and enhancing the play experience.

**THE PLAY-MATERIALS**

The six boxes of play-materials all contain LEGO constructions and elements that belong within the Studio theme for instance lights, microphones, cameras etc. Hereto come the LEGO play-materials (props) that are needed for the movie that the children create. These props can relate to any system theme e.g. City, Castle or Western. All action oriented environments and well known from the real film industry containing great opportunities for special effects, cheap tricks and stunts.



The opportunity for mixing two themes is natural embedded in the whole set-up. LEGO Studio combined with another theme e.g. Castle as shown at picture above makes it possible to utilize and give “new life” to earlier purchased LEGO Themes and hopefully an interest in purchasing new ones.



The 6 different play-materials items vary in second theme (props), retail price and size. From the small boxes with a retail price at approximately \$15 to the Mega box containing a considerable amount of LEGO Bricks, a LEGO camera and the LEGO studio *inspirational* and *editing* software.

## **THE CAMERA**

The camera selected by the LEGO Group to be part of the LEGO studio concept is provided and developed by Logitech. The Camera has approximately the same specifications as The Logitech Home camera, which currently can be purchased.



### **Specification for the Logitech camera:**

- Camera connects through a USB port (5 m. cable)
- 16-bit colour camera with 30 fps at CIF 352 x 288 resolution + still image
- Programmable button and LED
- Microphone embedded in camera
- Camera chassis - a LEGO Brick.

## **THE SOFTWARE**

The LEGO studio software can be divided into two parts – an inspirational part and a video editing part.

The main objectives of the inspirational part are to:

- Introduce the user to the art of making movies and the terms and concepts it involves.
- Introduce the user to the special effects and tricks that are doable within the LEGO Studio product. This is relevant for hardware (e.g. lights and zoom), play-materials (how to create backgrounds, special effects, Foley sounds etc.) and Software (transitions, editing tricks etc.)
- Inspire and challenge the users to come up with their own ideas for projects.

The inspirational software is mainly what we define as a multimedia title with the purpose of showing engaging animations and films that inspire the user and teaches about moviemaking concepts. The software is an obvious candidate for being developed in Macromedia Director.

The main objectives of the video-editing software are to:

- Provide the user with an introduction to the software, hardware and play-materials
- Provide the user with inspirations for doing own projects
- Support a direct video signal in order for the user to “play around”
- Bring in video and microphone signals from the Logitech camera
- Edit the different inputs (sounds, text and video) and finalising a movie
- Showing the final movie in an inspiring environment.

Currently we are looking at different off-the-shelf products, whereas AVID Cinema is one possible application to build upon. When selecting the most appropriate software it is important to stress and acknowledge that the software is part of a bigger whole. The most important objective of the software is to support the overall play situation and when the users are 8-12 years old - a kids-friendly user interface is of outmost importance. *Simplicity is a keyword.*

Instead adding features to the video editing software it is the design philosophy that the application must act as a tool that is very simple to handle and to understand. The special effects and tricks will happen in the real world smart and creative LEGO constructions.

We imagine that the flow of the overall play-experience is embedded in the following steps:

1. Get inspired / Get an idea
2. Build up the environment
3. Bring in the video-clips
4. Edit the video (sounds, speak, text, transitions etc..)
5. Preview the video and evaluate the result
6. Show or distribute the movie

We foresee that the steps 2-5 are an iterative process where user repeatedly gets better at the processes involved and challenge himself during the movie creation – both in form of mental, creative and physical building skills.

## **SOFTWARE MODULES AND FEATURES**

In the following we will walk through the different features that we anticipate the software will contain. The concrete feature list is based upon AVID Cinema Beta version.

### **Installation**

Video editing puts high demands on the PC, both in terms of processing and hard disk requirements. Therefore it can be expected that some initial set-up procedure on installation will be required. For instance an adult may set a special folder with an upper level for usage of hard disk space. However it must be considered whether technical terms like DMA and 16-bit colour display settings are necessary for having a successful installation of the product. We must always have in mind that we developing a toy for children in the age group 8-12.

Keywords for the installation of both camera and software are:

- Checking HW requirements e.g. hard-disk space and memory available
- Change of computer setting in order to run the product.
- Setting an upper limit for hard-disk usage
- Installing Camera driver and needed camera software
- Getting instant feedback on the successful steps taken e.g. camera connection
- Getting help during installation in an safe, guiding an interactive way



### **Tutorial and inspirational material**

A tutorial should be implemented in software explaining the basics of the overall product, which include play-materials, camera and software. The tutorial must also introduce the flow and different steps that the user goes through when creating a movie. An introduction to most basic functions will also be included in the tutorial.

The tutorial must involve some kind of interactivity in order to make it more exciting. Ideally the user should be able to make a small movie while getting introduced to the product.

An idea can be to develop an instructional video made with the product itself. For instance if Steven Spielberg is used as a guide (content provider), he should spend a weekend shooting a movie using the actual LEGO Studios product. Even the outtakes and mistakes will provide valuable inspiration to the end user.

Another idea relates to the issues of:

- What inspired Spielberg / Lucas / etc?
- How did he do it?
- Hints and tips
- Books / Stories

The inspirational part could also involve an idea bank for project that can be made with product including the play materials. It could for instance contain semi created movies, which the user needs to finish.

### Storyboard

This activity involves storyboarding activities. The storyboard that is implemented in AVID Cinema is divided into different clips that the user plans to make. In the storyboard section the user can write down film and editing tips – things that he needs to remember when he gets into film and editing mode. The storyboard relies only on written text and there can't be done any visuals at all. The point of it is that you plan, print and use it while filming as a guideline.



It is to be explored and investigated if the storyboard feature appeals and is usable by the target group.

An idea that relates to the use of storyboards is that these are used as idea generators and help for new users. The user selects the play-materials set that he has purchased – and gets an appropriate storyboard that helps him develop an exciting movie. If storyboard and some pre-made clips and sounds are made this could act as co-promotion for other studio sets.

### Bring Video in

This activity regards the process of bringing video and sound in.

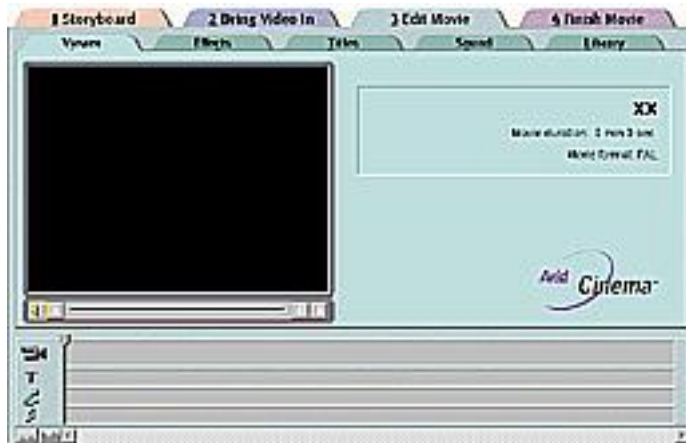


The screen includes the following features:

- A big display screen, which shows the videos that are brought in. This is a general function within the different screens in the AVID software. We consider this function very necessary. The output shown is normally under influence of the slider control (main editing control). This means that the user is easy in control of what is being shown.
- Time and hard disk space available. A necessary and informative feature.
- Record and stop button. In addition to these two buttons we would like to *add an animation (stop-motion) function and a still function*. Regarding the still function it would be beneficial if it were possible to printout any picture taken with the camera. These functions depend upon the possibility of programming up against the Logitech API. The camera has a programmable button in which it should be possible to control either (record/stop), animation (frame by frame) and still pictures. The toggles between the different function should be set in the software.
- Sound volume and mute. These functions regard the possibility of bringing in sounds together with the video-signal. As default the microphone embedded in the camera delivers the sound input signal.
- Storyboard control. This function is dependant upon if the storyboard feature will be kept in the software. The control makes it possible to bring in video in the order that the user prefer. It also helps the user to get an overview of the film project.

- The video clips control shows the length of the different videos brought in.
- Zoom in and out. A necessary control that is available at most places in the software.
- TV channel changer will probably not be necessary within the LEGO Studio software.
- Timeline scrollbar makes it possible to see different parts of the timeline.

### **Edit Movie – Viewer**



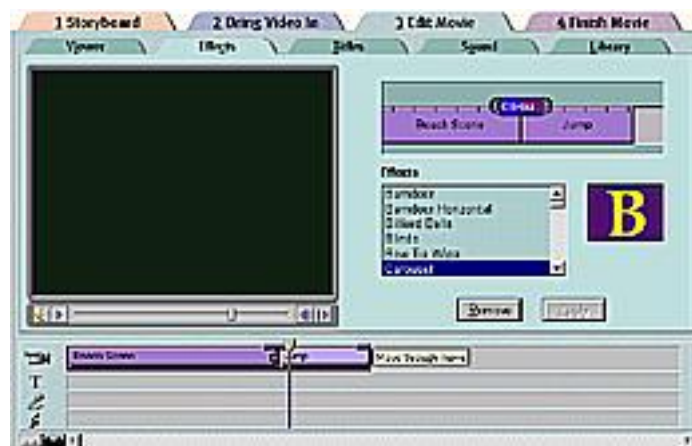
The viewer screen is where the user can see the length of the movie, play them, cut, copy, paste and split the clips. The viewer tab also makes it possible to adjust the amount of video or audio at the beginning and end of each clip – also called trimming. The purpose of the screen is to trim already brought in material and preview it.

Information regarding output format e.g. PAL is not necessary.

It is to be investigated if the viewer section actually is needed. If all functions needed actually are present and available under the library section.

### **Edit Movie – Effects**

This section involves the settings of transitions. A whole range of transitions (over 100) is currently available in AVID Cinema software.



When a transition is selected and applied it is automatically put in between two video clips. The transition can be either squeezed or made longer in time. Manipulating the transition directly on the bar does this.

At this page the following functions are available:

- The bar where all videos, transitions, sound, text and music is available. An effect marker shows where the applied effect is placed.
- A remove and apply button for adding or removing transitions.
- A preview display, which show an animation of the selected transition



- Preview display that shows the transition as it will look like in the finished movie.
- The close-up effect handler where the handles of the effect slider to adjust the duration of the effect can be dragged.

**Edit Movie – Titles**



In the title section, the user can superimpose text over his movie including scrolling text, such as credits at the end of the movie.

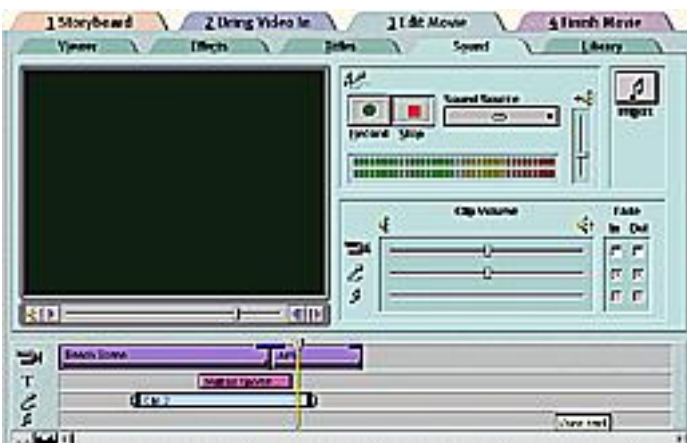
The title page contains the following functions:

- Controls for making text bold, italic or underlined. (These functions are maybe not necessary).
- Controls to align text (These functions are maybe not necessary)
- Window for typing in the text that need to be shown
- Controls for scrolling, font, size and colour
- Apply and remove button for removing and adding titles
- Timeline Bar to organize and trim title clips.

It is to be explored and investigated if this section could contain special pre-made filters and effects like black and white, explosions, rain etc..

Another issue relates to opportunity for making long titles e.g. for credit lists. Today there is a limit to how many lines of text it is possible to superimpose.

**Edit Movie – Sound**



Under this section the child can record narration over the clips (if not done while shooting the clips), import tracks from a music CD, add sound files (e.g. sound effects), adjust the volume and fade in and out.

This page has the following functions:

- Record and stop buttons for recording sound.
- Control for selecting sound source. In the source list many opportunities are available and we will only need the most basics e.g. sound files, microphone, CD, line in. One needed source besides of the ones implemented the Camera Microphone.

- Import button for import of CD track or a sound file. This function may be implemented together with the sound force function or moved to the library function.
- Volume slider for adjusting the sound level
- LED volume meter
- Clip volume makes it possible to adjust the volume of individual clips. It has to be investigated if it is necessary with 3 different sliders instead of only having one.
- Fade in/Out. This function make the sound fade in or out.

**Edit Movie – Library**

In the Library section the user can see a list of all the video, narration and music clips available for use in the movie. One of the features is preview of all clips in a special viewer and drag clips into the timeline bar. It is also possible to import photos, graphics and other digital media into the movie.



This page includes the following functions:

- List button which lets the user browse a list of all clips in the movie
- Preview button which previews the selected clip in a small window
- Import button, which imports a video, audio or graphics file into the project.
- An alphabetic list over the clips that the user has brought into the project.

It is a wish (if the storyboard section is needed) that it is possible to bring a clip into a selected storyboard clip instead of creating a new.

**Finish Movie**

The finish movie section is the place where the user goes to after he has edited the movie and wants to show or publish it. The opportunities at the finish page are the following:

- Preview the movie on a full computer screen
- Save it and post to the Internet or in an e-mail
- Publish it on a CD or in a multimedia presentation
- Save it to a videotape



In relation to LEGO studio the function that lets the user save it to videotape is probably not the most necessary function. On the other side if the user has an appropriate video card it is a nice feature that it can be exported to a tape. However it must not influence the simplicity of the software.

### **General issues**

The following points are all ideas or issues that we would like to add or remove from the AVID software.

- If the user adds a sound or movie clip in between to already existing clips everything is pushed backwards that is if the clip is longer than the free time available. This behaviour is nice at sometimes but at other times it is wished for that the imported clip were overwritten. A function called fit imported clip into section would be a nice feature.
- Multi selection of clips is not possible. The user has to move every single clip manually.
- A Trashcan for deleting clips. When the user get used to direct manipulation by clicking on buttons, dragging and dropping it seems a little bit awkward that he needs to use the keyboard when deleting clips.
- The possibility of taking a still picture out of an existing movie clip to make e.g. for making a fixed background.
- Opportunity for Time warp (slow, fast) and backwards
- Effect for voices (scary, metallic, echo, pitch etc.)
- Print out posters and tickets

### **Help**

The help system implemented must be more graphical oriented and contain less text. The help system should also be in some degree interactive and "clever" - so help is provided e.g. for sounds when the user is on sound section – providing his movie with sound.

### **Dialog boxes and File handling**

The dialog boxes and file handling we will contain the current Windows interface – which the user is in some degree familiar with. On one side we would like to get remove all Windows familiarity like buttons and the grey Color – on the other side we recognize that the users know how to handle these dialog boxes and know the icons for e.g. save, load etc. We must also consider the amount of resources that are necessary in order create and test new icons for the essential and well-known file-handling functions.

One thing that we find essential in relation to file handling dialog-boxes is a good pre-view function for movies (AVI, MOV) and sounds (Midi, Wav, AIF).

### **User Interface**

The main user interface needs to be investigated and explored both from a graphical point of view and from a function perspective. The graphical look must signalise: Simplicity, LEGO Studio and must take the target group conceptual understanding and what they like and find "cool" into consideration.

It has to be explored if it is appropriate to divide the UI into two levels of competence: Normal and Expert.

Test and workshops with the target group needs to clarify the issues mentioned above.

### **Printed guide (Getting started, projects ideas and tips and tricks)**

Currently we are investigating the possibility of developing a printed book.

The objectives of a printed book are to:

- Give the user an overview of the product (both play-materials, software and hardware) and how to get started
- Provide the user with tips and tricks on moviemaking (both play-materials, software and hardware)
- Project Ideas

A possible developer for a printed book may be LEGO Media Print division

**WHO DOES WHAT...**

**1. Segment 4-9 Marketing**

Product Management

Identifying 3rd party for content

**2. Segment 4-9 Model Design (Futura)**

Models

**3. LEGO Hardware R&D**

Camera - Internal

**4. LEGO Media International**

Concept Development & Development , Creation of Graphical Interface, Business Affairs, Customer Support(?)

**5. Logitech**

Camera, APIs and Drivers

**6. Technology Developer**

Implementation

**7. 3rd Party Content Provider**

A company such as Dreamworks or a name such as Spielberg. Brings endorsement/branding/extra relevance to the product

**8. QA**

External QA for Hardware/Software

**DEVELOPERS**

The developers that have been approached are not traditional software developers that need publishers but technology companies that have a proven product track record on the tools and technologies that Gateway requires.

**The plus of this approach is:**

- Ready-made products with appropriate type of functions
- Customising ready-made product for the required functionality
- Would not be starting the application from scratch
- Already tried and tested technology from a QA stand

**The minus:**

- Technology companies are not design oriented
- Have little or no experience of producing software for our target age
- Development relationship may be difficult to establish
- We probably have to bring another party into the equation to supply interface designs and graphics. (We are currently working with a small design team who, depending on results, will provide the interface design and graphical assets that the product will require.)

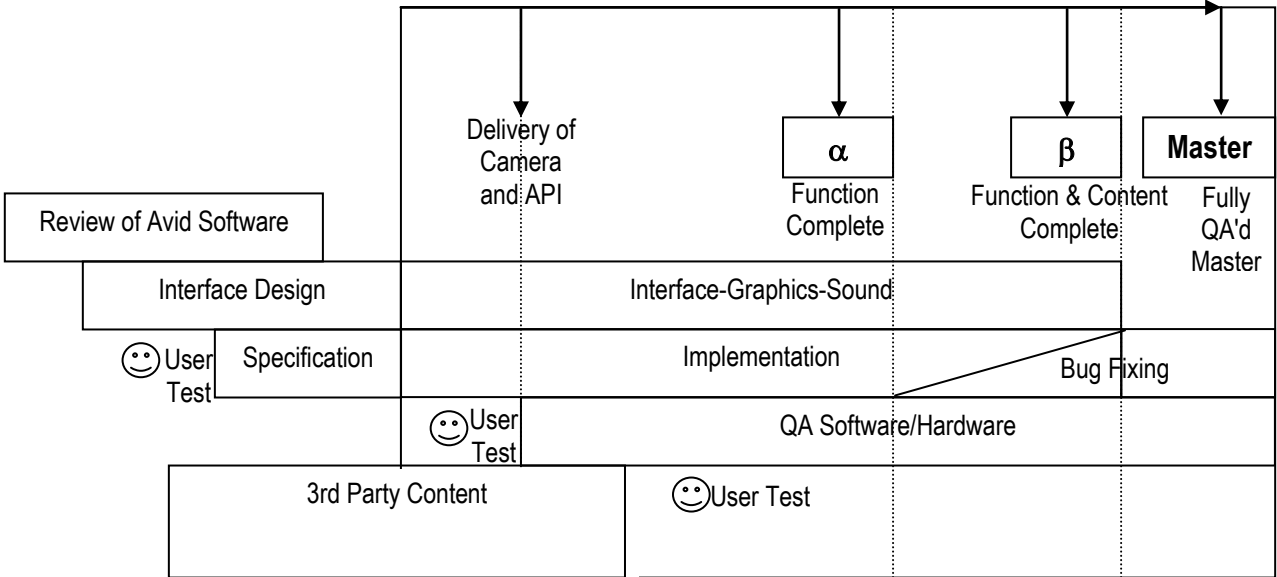
**TECHNOLOGY PARTNER:**

**Avid:**

- Product - **Avid Cinema**
- US Based
- Has 200.000 copies of Avid Cinema installed in schools and is shipped as OEM with most school Macintoshes.
- Will implement graphical changes to Avid Cinema to fulfil LEGO requirements
- LEGO Media will produce all graphical assets to be incorporated into Avid Cinema to achieve a LEGO look and feel in the product.
- Will supply implementation free of costs in exchange for LEGO/Avid communication to our target group and user data collected through registration cards
- By delivery date will have translated their own software into 4 or 5 languages which we can benefit from
- LEGO will pay in full for localisation of languages in which Avid does not have an interest and will collaborate on those both companies want to have
- Can deliver the product by Q3 next year.

**PROJECT ANALYSIS**

Concept	Proposal Phase	Specification Phase	Development Phase
Creates initial Concept & Brief Identification of Developer Production of Style and Art Direction for Avid Software User Test on Avid Software Initial Software Spec	Spec to Avid Agreement with the Developer Development Strategy Technical Analysis Work on art direction/branding Schedule & Budget Version 1 Contracts	Creates Product Specification (Help & Tutorial, script, flow charts, interfaces, functionality) Technical Design Graphical Assets Schedule & Budget Version 2	Product Development Milestones Prototype Alpha Beta Gold Master (US English) - Delivery into manufacture QA
<b>Gate 1 to Gate 2 Concept and Business</b>	<b>Prior to Gate 2 - Approval of Concept &amp; Business Model</b>	<b>Approval into Development prior Gate 2</b>	<b>Approval of Milestones</b>



**GSM**

**3rd Party Content Contributor**

GSM has expressed the need to create a section in the software that will receive input from an external contributor such as Dreamworks. As this is a marketing requirement, it is essential to point out that tasks such as identifying the contributor and coming to agreement as to their input and involvement is the task of GSM.

It is also extremely important that an external contributor works within certain specified parameters in order not to add risk to the development process. GSM and the contributor should draft a specification of what it is required of the contributor. Once the final specification has been negotiated and approved, the contributor should work with it.

Some of the initial ideas pointed towards the following:

Identifying a well known name in the movies

Getting the contributor to make a tips & tricks section about movie making

Showing a movie made by the contributor using the LEGO cam and the Gateway software

Due to the set up of the project, using an already existing piece of software, the program which will contain the 3rd party contribution, should be handled as a separate application which will sit in the same disk. This will help cut development risk, QA and implementation problems. There will be a further company involved in producing this application.



## **GATEWAY WEB**

There are a number of things that Project Gateway could do over the web to benefit different areas and enhance the product experience.

Product:

- Provide support for users of LEGO Studios software and cut Customer Support calls
- Increase functionality through downloads/uploads
- Provide other downloadables utilities that will increase the use of the camera

Sales and marketing:

- Increase customer awareness of LEGO Studios range
- Create traffic through LEGO.com which benefits LEGO Studios and other ranges
- Create brand loyalty

Some of the elements that Gateway Web should offer are as follows:

Basic:

- Range Description - this should describe the range and the software
- Software Description - what is it, what does it do, screen shots, samples of what you can do with it and comments/tips for content partner
- Software Specification - Minimum Specs required to run the software
- FAQs - for current owner of the software this is a trouble shooting section which should minimise calls to the customer support line

Full:

- A LEGO Studios owners club - this provides several unique features such as:
  - Competitions
  - Project Ideas
  - Upload your movie for the Showcase of best entries
  - Download best movies
  - Download goodies for the software
  - Download extra software for the camera such as the Mindstorms application for video conferencing and web video mail (this would give extra use to the camera and reinforce why you should have the LEGO camera and not another)

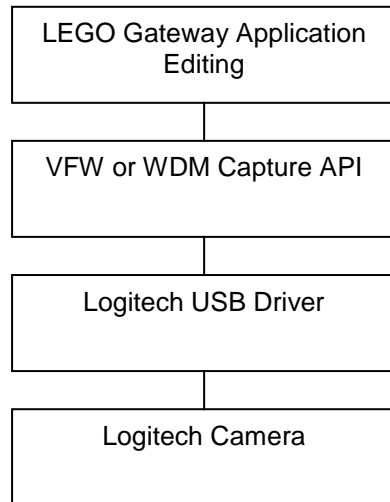
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**TECHNICAL SPECIFICATIONS**

This explains in short what kind of technical specifications the LEGO Gateway hardware and software involve and focuses on the PC/Windows platform

**Architectural overview**

A simplified architectural overview of the PC/Windows system looks like this:



**Technical specification for the Logitech Camera solution (Emerald)**

The camera solution from Logitech, which the LEGO group has selected, is the Emerald solution. This solution is very close to the Logitech Home Camera, which already is on the market.

THE TECHNICAL SPECIFICATIONS:

- Video frame rates: 30 fps at CIF (352x288) + still image
- Lens: manual focus, f 2.0, f=3.6mm, 43 degrees horiz. field of view, plastic
- Focus range: 15 cm to infinity
- Image sensor: CMOS 352x288 pixels color
- Video formats: RGB 16, 24 & 32; YUY2; YVU9 and I 4:2:0
- Capture resolutions: CIF (352x288), SIF (320x240), QCIF (176x144), QSIF (160x120), SQSIF (80x60)
- Power consumption: <100 mA at 5 Vdc, <500 uA suspend
- Compliance: FCC, UL, CE & C-Tick mark
- OS support: Windows 98 & 2000
- Cable length: 5 m
- Operating temperature: 0 to 40 degrees C
- Storage temperature: -20 to 70 degrees C
- Storage altitude: 0 to 40,000 feet
- Operating humidity: up to 85%
- Interface: USB; USB Specification 1.0 compliant
- Video dynamic range: 40 to 10,000 Lux
- Shutter: Auto or programmable 1/10, 1/15, 1/20, 1/25, 1/30, 1/50, 1/100, 1/120, 1/250, 1/500, 1/1000, 1/2500
- Backlight compens.: Automatic or programmable
- Gain control: Automatic or programmable
- Gamma correction: Automatic or programmable

**System Requirements**

- Microsoft Windows 98 or Windows 2000
- Pentium 166 MHz with MMX or faster
- Available USB port
- 16 MB RAM
- Hard drive with 50 MB free space
- 16 bit colour display

GENERAL

Prototype: November 1999 (for functionality testing)  
Production: January 2000

**Technical specifications for the software**

Since we do not have selected any software developers and do not have any agreement yet we have chosen to take our outset in the specifications for the AVID Cinema product (ver 1.5). However a consideration must be made here, since specifications most likely will differ depending on the software application and the features it contains.

**System Requirements**

The system requirements for the PC/Windows platform (Avid Cinema for Windows softpac ver. 1.5) are:

- 200 Mhz Pentium with MMX, Pentium II processor or Pentium III, Intel equivalent with MMX (AMD-K6) or Celeron processor with 128 K cache.
- Windows 95 (OSR2) or Windows 98
- 32 MB RAM / 64 MB recommended
- CD-ROM Drive
- AGP or PCI slot for video capture card
- Sound Blaster or compatible sound card

The Avid cinema storage requirements are the following:

<b>Final Video</b>	<b>Disk Space required to edit</b>
1 min	70 MB
5 min	350 MB
10 min	700 MB
15 min	1.05 GB
20 min	1.4 GB
25 min	1.75 GB
30 min	2.1 GB

**Conclusions on the technical specifications**

The following is a summary of the system requirements mentioned previously. It based on highest common denominator and what we believe will be the requirements for the final product.

PC/WINDOWS PLATFORM

- 200 Mhz Pentium with MMX, Pentium II processor or Pentium III, Intel equivalent with MMX (AMD-K6) or Celeron processor with 128 K cache.
- Windows 98 & Windows 2000
- 64 MB RAM
- CD-ROM Drive
- Available USB port
- Hard drive with 500 MB free space (both for editing and installed application)
- 16 bit colour display
- Sound Blaster or compatible sound card